New Myocardial Infarction Treatment System

STEMI RECEIVING CENTERS

By BRUCE E. HAYNES, MD

A new cardiac care system now sends patients with ST elevation myocardial infarction directly to hospitals with cardiac catheterization laboratories for angioplasty or stent placement. Recent evidence shows this will diminish door-to-balloon times, improve outcomes, and reduce mortality from acute myocardial infarction.

RECENT TECHNOLOGY GIVES paramedics the ability to perform a full 12-lead electrocardiogram in the field with machine EKG interpretation that identifies patients with ST elevation myocardial infarction (STEMI). Patients with chest pain and a STEMI on the EKG are now triaged to one of 12 hospitals designated as "STEMI Receiving Centers": Sharp Chula Vista, Scripps Mercy Chula Vista, Alvarado, Scripps Mercy, UCSD Hillcrest, UCSD Thornton, Scripps La Jolla, Sharp Memorial, Sharp Grossmont, Scripps Encinitas, Tri-City, and Palomar. U.S. Naval Hospital Balboa is also designated and should join the system in the near future.

A field 12-lead allows diagnosis of STEMI and avoids triage of patients with undefined chest pain, unstable angina, or non-STEMI acute coronary syndromes. The program's goals are rapid access to primary percutaneous interventions (PCI) and assuring door-to-balloon times are as low as possible, especially under 90 minutes. Ultimately, it is anticipated that most patients will eventually have door-to-balloon times under 60 minutes.

Evolving medical literature suggests primary PCI has a number of benefits over traditional use of intravenous thrombolytics in STEMI patients. Randomized clinical trials and a number of meta-analyses (including Keeley et al, Lancet, 2003) demonstrate that patients receiving primary PCI are more likely to survive, have fewer nonfatal reinfarctions, and fewer strokes. Other benefits are the availability of adjunctive treatments such as intra-aortic balloon pump placement and other invasive procedures.

This process began several years ago with a "summit" among community physicians, hospital personnel, emergency medical services providers, and county emergency medical services. This group considered the evolving literature and experience with emergent PCI. Summit participants felt a STEMI Receiving System in San Diego was appropriate and would improve care of STEMI patients. This group evolved into a permanent Cardiology Advisory Committee through County Emergency Medical Services (EMS).

The County Board of Supervisors authorized EMS to go ahead with the new system, and criteria were developed for receiving centers, which include staffing and data collection requirements. Thirteen hospitals were surveyed and are now designated as STEMI receiving centers.

Improved door-to-balloon times are achieved by systems to rapidly activate cardiologists and cath lab personnel when a STEMI patient is identified in the field and focus on reducing times. To this point, the EKG interpretation is communicated verbally to the hospital by paramedics. At several hospitals, however, Tri-City, Palomar, and Scripps Encinitas, equipment is in place for transmission of the actual EKG to the hospital so the emergency department physician can interpret the EKG. Palomar Medical Center pioneered this use. Computer interpretation does lead to some false positive readings with unnecessary activations, and transmission improves the accuracy.

Since direct transport to a STEMI receiving center will be limited to patients with documented STEMI in the field, the

PRACTICE ANNOUNCEMENT

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Education and Training

- M.D. (1994) University of Kansas.
- Psychiatry Residency (1994–1998) University of New Mexico.
- Sleep Disorders Fellowship (1998–2000) University California, San Diego, School of Medicine.

Board Certifications

- Diplomate, American Board of Psychiatry and Neurology (2000).
- Diplomate, American Board of Sleep Medicine (2002).

Academic Appointment

- Assistant Clinical Professor. University of California, San Diego, School of Medicine.

Clinical Affiliations

- Staff Physician. Scripps Memorial Hospital, La Jolla, California.
- Staff Physician. Pomerado Hospital, Poway, California.
- Member Physician. Ximed Medical Group.

Professional Memberships

- San Diego County Medical Society.
- California Medical Association.
- Fellow, American Academy of Sleep Medicine.

Selected Awards

- Lilly Fellowship Award (1997) Society of Biological Psychiatry.
- Glenn Foundation Endocrinology and Aging Award (1998) Endocrine Society.
- President's Award (2005) San Diego Psychiatric Society.

San Diego County Health Statistics

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DISEASES OF THE HEART are the leading cause of death in San Diego County for both men and women. In 2004, the age-adjusted rate for the total San Diego County population is 187.2 deaths per 100,000 population. "Diseases of the heart" includes hypertensive and ischemic, as well as rheumatic disease, pulmonary heart disease, diseases of the valves or electrical conduction. (ICD-10 codes I00-I09, I11, I13, I20-I51)[1].

IN FISCAL YEAR 2005-2006, there were 900 emergency department discharges for coronary heart disease (CHD) in San Diego County. The age-adjusted rate is 31.0 discharges per 100,000 population. CHD refers to hypertensive and ischemic heart disease (ICD-9 codes 402, 410-414, 429.2)[2]

TO REQUEST ADDITIONAL health statistics describing health behaviors, diseases, and injuries for specific populations, health trends, and comparisons to national targets, please call the County's Community Health Statistics Unit at (619) 285-6479. To access the latest data and data links, including the regional community profiles and core public health indicators document, go to www.sdhealthstatistics.com.

[1] "Leading Causes of Death by Sex, 2004," County of San Diego, HHSA, Community Epidemiology, Death Statistical Master Files.

[2] Hospital Association of San Diego & Imperial County, Community Health Improvement Partners, County of San Diego, HHSA, Emergency Medical Services, Emergency Department Database.

number of patients should be relatively small, on the order of 300–400 patients each year triaged from the field. Emergency department physicians will have the ability to activate 911 to immediately transfer walk-in patients or patients who develop a STEMI after arrival. For walk-in patients at non-STEMI receiving center hospitals, the decision whether to treat onsite with IV thrombolytics or transfer for PCI will be made by the emergency physician in consultation with the cardiologist.

Emergency medical services responds to about 11,000 patients each year with chest discomfort that is considered to be cardiac in origin, and the destination of the vast majority of those patients will remain the same. Patients are transported to their hospital of choice, or, if they do not have a preference or are too unstable to go farther, they are taken to the closest facility. Cardiac arrest patients will continue to go to the closest hospital. STEMI patients in cardiogenic shock manifested by hypotension and other signs of shock will be taken to a STEMI receiving center, since they benefit the most from an invasive approach with PCI.

The newly formed Cardiology Advisory Committee will continue in existence to review the resulting door-to-balloon times and patient outcomes. The committee will serve as a focal point for improvement processes to assure door-to-balloon times are acceptable and as short as possible. The members will also consider other changes in cardiac care to improve patient care.

For questions, comments, or suggestions regarding the system, please contact Dr. Bruce Haynes at (619) 285-6429 or bruce.haynes@sdcounty.ca.gov.

ABOUT THE AUTHOR: Dr. Haynes is the Emergency Medical Services (EMS) medical director for the County of San Diego. He joined EMS as interim medical director in February 2006 and assumed the permanent position in August 2006. Previously, he was EMS medical director in Orange County for 14 years and was director of the state EMS authority for four years. He trained in emergency medicine.